

a reflector configured to reflect one of the following: the first reflected light and the defocused light;

a second beam splitter configured to substantially transmit part of one of the following: the first transmitted light as unaltered light and the defocused light as defocused light and configured to substantially reflect part one of the following: the defocused light as defocused light and the first reflected light as unaltered light; and

a first detector positioned to receive the defocused light and the unaltered light with respect to a first object plane and the defocused light with respect to a second object plane, the defocus system configured to modify optical power such that the first depth of focus overlaps the second depth of focus, the second beam splitter oriented according to a mechanical angle such the unaltered light and the defocused light have an angular separation.

14. For imaging a target object, an imaging system comprising:

a first beam splitter configured to substantially transmit part of collected light as first transmitted light and to substantially reflect part of collected light as first reflected light;

a defocus system configured to modify optical power of substantially one of the following: the first transmitted light and the first reflected light to transmit as defocused light;

a reflector configured to reflect one of the following: the first reflected light and the defocused light; and

a second beam splitter configured to substantially transmit part of one of the following: the first transmitted light as unaltered light and the defocused light as defocused light and configured to substantially reflect part one of the following: the defocused light as defocused light and the first reflected light as unaltered light, the second beam splitter oriented according to a mechanical angle such the unaltered light and the defocused light have an angular separation.

15. For imaging a target object, a method comprising:

substantially transmitting part of received light as first transmitted light and to substantially reflect part of received light as first reflected light;

modifying optical power of substantially one of the following: the first transmitted light and the first reflected light, and to transmit the same as first transmitted defocused light;

reflecting one of the following: the first reflected light and the first transmitted defocused light;

transmitting part of one of the following: the first transmitted light as second transmitted light and the first transmitted defocused light as second transmitted defocused light and configured to substantially reflect part of one of the following: the first transmitted defocused light as second reflected defocused light and the first reflected light as second reflected light; and

focusing one of the following pairs of light: the pair of the second transmitted light as imaged unaltered light and the second reflected defocused light, as imaged defocused light and the pair of the second transmitted defocused light as imaged defocused light and the second reflected light as imaged unaltered light and to focus the imaged defocused light with respect to an imaged defocused image plane and the imaged unaltered light with respect to an imaged unaltered image plane separated from the imaged defocused image plane, the second beam splitter oriented according to a mechanical angle such the imaged unaltered light and the imaged defocused light have an angular separation other than zero.

16. For imaging a target object, an imaging system comprising:

a first imaging sub-system comprising a light collection system positioned with respect to the target object in a first orientation, the first imaging sub-system configured to transmit a first image of the target object;

a first detector positioned to receive the first image of the target object at a first location on the first detector when the target object is in a first target location and to receive the first image of the target object at a second location on the first detector when the target object is in a second location different than the first location of the target object;

a second imaging sub-system comprising a light collection system positioned with respect to the target object in a second orientation different than the first orientation, the second

imaging sub-system configured to transmit an second image of the target object at a best focus distance from the second imaging sub-system;

a second detector positioned to receive the second image of the target object; and

a processor communicatively linked to the first detector and configured to determine a distance between the first location on the first detector and the second location on the first detector, the processor communicatively linked to the second imaging sub-system and configured to transmit instructions to the second imaging sub-system based upon the determined distance between the first location on the first detector and the second location on the first detector, the second imaging sub-system configured to change the best focus distance from the second imaging sub-system based upon the instructions received from the processor to correct focus.

17. The system of claim 16 wherein the first orientation is along an x-axis and the second orientation is along a y-axis, the x-axis and y-axis being substantially perpendicular to one another.

18. For imaging a target object in a flow stream, an imaging system comprising:

a first imaging sub-system comprising a light collection system positioned with respect to the target object in a first orientation, the first imaging sub-system configured to transmit a first image of the target object;

a first detector positioned to receive the first image of the target object at a first location on the first detector when the target object is in a first target location and to receive the first image of the target object at a second location on the first detector when the target object is in a second location;

a second imaging sub-system comprising a light collection system positioned with respect to the target object in a second orientation, the second imaging sub-system configured to transmit an second image of the target object;